BUS INDUSTRY CONFEDERATION
moving people

ADR Harmonisation Review 2024-25

(Full Submission)

February 2025

Preface

The following information is the final submission and supersedes a provisional summary provided on the 24 January 2025. The Bus Industry Confederation (BIC) obtained an extension from DITRDCA for the submission due to the timing of the consultation period. BIC appreciate the extension provided.

Zero emission buses in construction at a Factory in Brisbane

Contents

The Bus Industry Confederation

The Bus Industry Confederation (BIC) is the national peak body for the Australian Bus and Coach Industry. We represent bus and coach operators, body, chassis and complete bus manufacturers and suppliers, parts and service providers, professional services, and state bus associations on issues of national importance.

The BIC advocates on behalf of all our members to federal, state and territory governments, and associated bodies, to ensure the safe and efficient carriage of passengers, along with safe and sustainable operations and supply chains that support the industry.

The bus and coach industry is undergoing a major transition on multiple fronts. Firstly, the rapid transition of our fleet to low and zero emission from 2025 onwards, largely driven by State and Territory governments, has resulted in the diversification of our members as key energy and infrastructure partners join. Furthermore, over several decades, the operational side of the industry has consolidated with a fundamental shift from generational family-based bus companies in our cities to national and multinational businesses contracted to state governments especially in metropolitan areas.

Supplier Landscape

The industry today is a diverse mix of locally manufactured and assembled, partially imported and assembly finished in Australia or fully imported vehicles.

In 2020 when the last detailed statistics in this area were conducted, 88.9% of public transport passenger route service buses and 59.6% of school buses were manufactured in Australia, the majority built by Australian body manufacturers on a European or Asian chassis; the remainder being fully imported buses and coaches primarily from Asia, with some from Europe and South America.

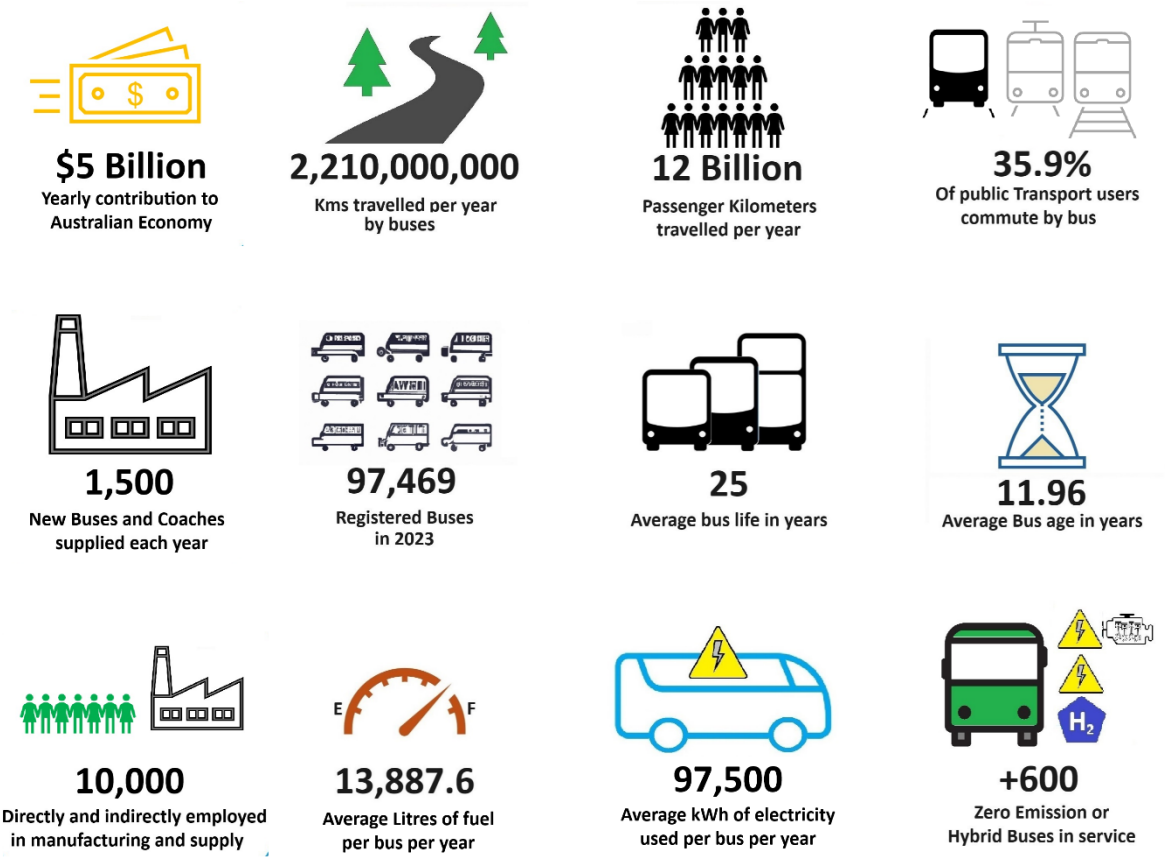
This diversity has changed over the last 20 years where 95% of buses and coach bodies were manufactured in Australia using a mixture of local and imported chassis technology predominately from Europe.

Economic Contribution

The bus and coach industry supports 10,000 employees directly and indirectly and contributes $5 Billion to the Australian economy.

The industry also contributes another $1.5 billion in supplies and services to keep the bus operational for a 20-25-year lifespan. Between 2008-2024 there were on average 1500 bus and coach deliveries a year.

Industry Facts at a glance



Full detailed facts are available via the BIC website: https://bic.asn.au/industry-stats/

Executive Summary

The Bus Industry Confederation (BIC) acknowledges the desire of DITRDCA to harmonise with international standards such as the United Nations regulations to provide smoother transition to new model vehicles, especially Zero Emission vehicles.

Timing of this consultation over the traditional Christmas & New Year shutdown period when much of the industry is on leave resulted in an abated provisional response.

The BIC submits that consultation on this topic requires a comprehensive and detailed response to reflect the complexity of the issues being questioned. Thereby acknowledging and respecting the knowledge and expertise of those asking these critical questions and to provide valid and relevant data as requested.

The concerns

The BIC not opposed to harmonisation where it is appropriate but highlight this is a complex task. European ADRs are not subject to the same extent of jurisdiction and independent regulator laws, policies and regulations that are already in place to support the bus industry. This is not a criticism, but the reality is that these parties, such as National Heavy Vehicle Regulator (NHVR), National Transport Commission (NTC) and state jurisdictions, have been more agile in supporting changes and requirements affecting our industry.

If there was a blanket adoption of the UN regulations, some local regulations developed would currently contradict the equivalent UN regulation. Put simply, it is not possible to build a vehicle to meet both standards in some cases, they require different solutions. Vehicle fire protection mitigation measures being such an example (UNECE R118 vs TfNSW Panel 3 & 4 specifications).

The BIC believe that the Department of Infrastructure, Transport, Regional Development, Communications and the Arts (DITRDCA) are under resourced to adequately support the industry, especially with the increase in and complexity of technology, and fast pace of technology advancement. The personnel in DITRDCA are generally very supportive, but there simply isn't enough resources to support the fast pace of change or industry needs.

Technology on buses can't always be grouped in with trucks or cars or just left behind because there are lower volumes. Buses are a unique category of their own and have unique technologies. We acknowledge the volume of buses are a fraction of cars or trucks, but buses have unique requirements to ensure the safe carriage of the general public to their destination.

In regulation development, there isn't enough focus on the buses to adequately support the Australian industry requirements to manage technology change .

Two examples of this are:

- Drivers safety screens, left to industry to develop.
- Bus safety working group being concluded after achieving only 1 of its 10 set objectives were completed

Perceptions

There is a general perception that international standards are always better than the Australian equivalents. This isn't always the case.

ADR 68 Occupant protection for omnibuses: This is where Australia leads the way on safety and strict standards. This regulation, developed after two major accidents, has led to a regulation specifically to suit the Australian bus transport sector. ADR 58 is another example.

Concerns: Industry is concerned that harmonisation will hinder local manufacturing and create the need to comply with international standards already used by overseas suppliers. This has the potential to create an uneven playing field. Conversely, overseas manufacturers have invested in complying local models to meet local regulations. Effectively this will lead to "re-compliance" of local models to international standards which may lead to unintended consequences including industry waste and increased cost of production.

It is important that any harmonisation provides an equal playing field for both locally manufactured, assembled and imported vehicles alike and is not a cost burden to industry.

What's possible

It's one thing to raise problems, it's far more impactful to suggest solutions. Harmonisation with international standards aimed at properly supporting the Australian bus industry and the public it serves (12 billion passenger kms every year) must ensure that:

- DITRDCA is sufficiently resourced to have a seat at the table any international standards development, and
- Australian industry peak bodies and key stakeholders are informed and therefore can collaboratively support DITRDCA and the industry as a collective.
- An equal playing field is maintained as mentioned above.

By focusing on these areas will enable faster localisation of international standards that do not inhibit industry or consumers. Two different but key examples of collaboration and participation working successfully are:

- The current UN Working Party 29 Group on CLIV (Children left in vehicles) collaboration has been very positive to date, and industry have welcomed and embraced this.
- Harmonisation of UNECE regulation R100 (electric vehicle safety) and R134 (hydrogen vehicle safety) into ADRs 109 and 110 respectively. DITRDCA and key industries (Car truck and bus) collaborated well to ensure this was practically and respectively achieved.

Key points:

In many instances, harmonisation can be achieved through regular collaboration and participation during the development process.

However, it is important to recognise that unique Australian regulations may sometimes be necessary or safer than international standards.

Industry want to help, not hinder.

Consultation Questions

Question: Ways in which the ADR process may be improved to reduce cost and improve timeliness

ADR's are generally developed after (in series with) with the international standards. However, there are opportunities where specific regulations permit, to implement a parallel introduction.

Improvements can also be achieved through clearly defined processes, strategic direction and planning opportunities. This will apply to any ADR, regardless whether zero emission or otherwise.

Parallel Development

When an international standard, such as an UNECE regulation, is being developed or updated to a new revision, a parallel evaluation of the impact of the requirements or change could be conducted by DITDRCA with support from industry. At the time of regulation development, this allows:

- Australian requirements to be requested and evaluated.
- Alternate local solutions are considered where Australian requirements are not possible.

Enabling a parallel introduction involves:

- Committed involvement from DITTRDCA at relevant working groups such as WP29 and other forums is crucial to the success of any implementation.
- Respective industry bodies are invited to participate at these forums to assist and positively contribute to the conversation, creating meaningful consultation with outcomes being reached sooner than circulation of papers alone.
- Further recognising the expertise industry brings to regulation. Being at the coalface, industry have a deeper understanding as subject matter experts and, when engaged appropriately, can assist DITRDCA, saving time, resources and money.

An example of working collaboratively as an active member with industry at this level is the current UNECE CLIV (Children left in Vehicles) Working Group. Australia is actively participating and have been represented by the BIC. It has come clear from this engagement that that Australia has already implemented successful solutions for what is a global problem.

Process

The process for revising or introducing ADRs has been a topic of discussion amongst peak bodies for some years. Currently, the implementation for each ADR goes down a slightly different path, which at times is unclear. Some ADRs have even been released with very little consultation and resulted in rushed changes after release to prevent industry not

being able to deliver vehicles as a result. Lane Departure Warning (LDW) was such an example. This 0makes it difficult for industry to plan.

There is an opportunity for the process to be more clearly defined through long term strategy clearly provided to all industries, such as:

- **Planning:** Better long-term regulatory strategy direction and planning, permits manufacturers better visibility on where to allocate resources for future product development, especially in relation to Zero Emissions.
- **Timing:** Practical timeframes for new regulations are consulted with industry prior to regulation implementation. As a general rule this is two years for new model vehicles, and three years for all (new) vehicles. This allows time for industry to develop solutions, especially where models are specific for the Australian market or locally produced.
- **Collaboration & Expertise:** A dedicated working group needs to be put into place with dedicated resources to commence work at an ADR level on addressing these areas. This working group should include government, regulatory bodies such as NHVR and industry representatives to start identifying the changes needed within other ADRs to ensure the full realisation of zero emission and modern technologies. BIC would be very supportive of such an initiative and something we strongly encourage further discussion on.

Key Points:

Parallel introduction, consideration of Australian requirements.

Timely industry active participation and collaboration.

Recognition of Industry expertise to assist DITRDCA in implementation of new regulations.

Process and planning to provide improved direction to industry on new regulations

Question: The extent to which the current ADR processes support or inhibit productivity and innovation in the vehicle and component manufacturing, road transport and other relevant industry sectors

The current ADR processes can both restrict and provide innovation that are unique to Australia's requirements, and the specific technical area they are covering. Whilst this may sound obvious, highlighted are some areas for consideration. Misalignment issue

Misalignment

Lack of change in ADRs and infrastructure regarding bus mass limits has resulted in these limits falling behind technology progress. Currently mass limits in Australia are Bus mass limits in ADRs 18% behind UN requirements [1]. This is just the surface of the issue.

Vehicle Type	ADR limit	HNVL Limit[2]	UN Limit[3]
 2 axle bus	16 tonnes	18 tonnes	19.5 tonnes
 3 axle bus	19 tonnes	22 tonnes	24 tonnes
 Articulated Bus	26 tonnes	26 tonnes 26.8tonnes (NSW)	28 tonnes

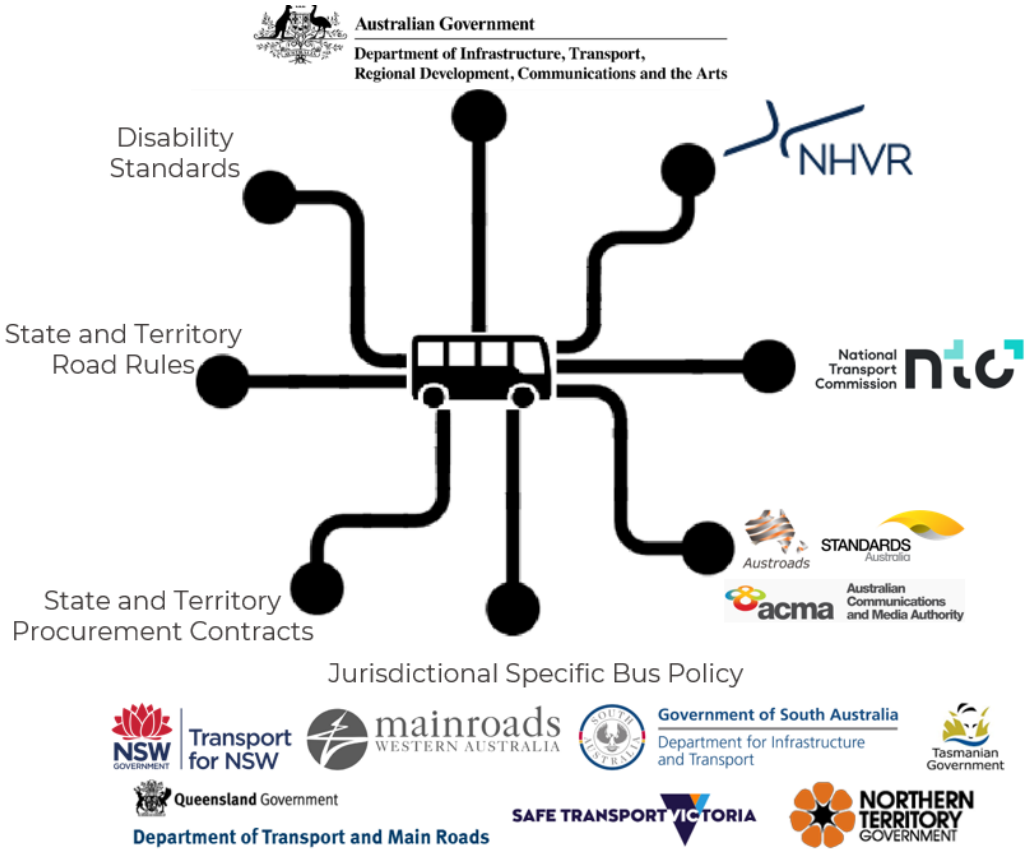
Example of variations between Vehicle limits within Australia and UN limits for the three most common vehicle combinations.

By way of an example, challenges of dimensional limits has resulted in the NHVR playing a vital role in helping the industry keep pace with industry requirements and technology. Some items are beyond the ADR teams' total control as they involve consultation with road managers on the various consequential effects of change such as possible increased road wear, driveability road restrictions etc.

Gap filling, combined with jurisdictional based requirements to fill their own specific needs (such as door safety, fire mitigation, recommendations of coronial enquires to name a few) has resulted in the web of regulations becoming increasing complex. Some gap filling measures were to address safety while others were to increase productivity and other both.

Any alignment with regulations to international standards needs to be carefully considered and unpacked to assess the ramifications of each change.

[1] 16t ADR limit vs 19.5t UNECE regulation limit
[2] https://www.nhvr.gov.au/files/media/document/406/202402-0753-nhvr-hv-bus-chart-a3.pdf
[3] https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A01996L0053-20190814



Interconnection of various regulations, policies and requirements for Buses

Examples where there is either a contradiction or an entirely different requirement altogether when compared to the ADR, other Australian regulatory body, jurisdiction compared to a UN regulation include:

- Weight increases *covered in Heavy Vehicle National Law (HVNL)*
- Long Buses (Controlled Access buses) *covered in NHVR Gazettals.*
- Fire protection requirements *covered in Transport for NSW (TfNSW) requirements and bus industry advisories.*
- Passenger Door Safety *covered in TfNSW standards and bus industry advisories.*
- Electromagnetic compatibility (EMC) and Electromagnetic radiation (EMR) *covered in TfNSW standards and bus industry advisories.*
- Standees on buses *covered in NT policy documentation.*
- Vehicle dimensions and specially Rear Overhang. Pa*rtially covered in controlled access buses but still misalignment to international standards.*

Rear overhang is specific example of misalignment where changing to an international standard such as UN requirements would be beneficial for some and a major issue for others.

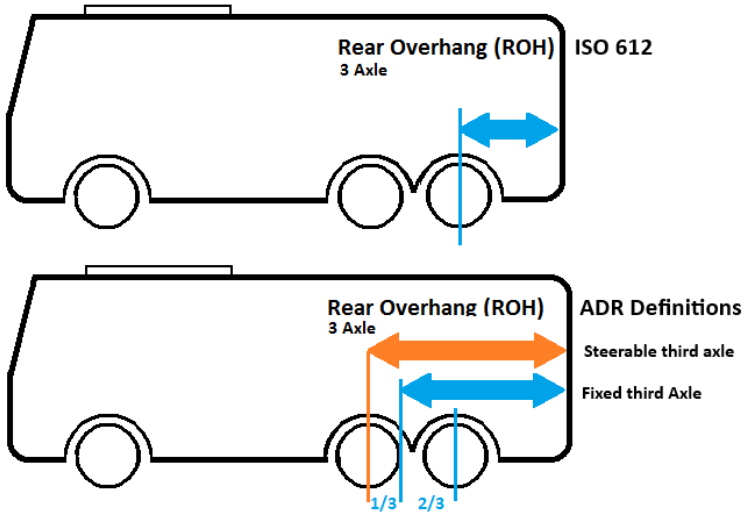
Advantages:

- Removes the requirement to shorten the rear overhang of a 3-axle bus to suit Australian ADR requirements. This will save up to $500,000 for development of each 3-axle bus model.

It would resolve a complex issue where a bus is legal to operate in one state but not another due to variations in rear overhang concessions allowed for under HNVL. These concessions were designed to provide productivity benefits and address ADRs being static for many years. This would provide a clear product cost and operator benefit to the industry.

Disadvantages:

- It becomes aa major issue for road infrastructure & designers due to vehicle tail swing when cornering being measured differently. Detailed interactions between vehicle and road regulators would be required to be addressed.



Rear Overhang (ROH) misalignment: International (ISO) vs Australian (ADR)

Blindly adopting a UN regulation without first comparing current landscape and consequences of this will cause more issues than it solves. This is at all not to say BIC oppose it in any way, but the solution lays in:

- careful gap analysis
- unpacking of conflicts and
- collaboration between industry and government to work a way forward.

Inhibit

At a drivetrain technology level, ADRs to date have not inhibited the technology introduction of zero emission or low emission vehicles yet. As example Euro 6 has been in widespread operation since 2014, and zero emission vehicles since 2019. It's the surrounding technologies and systems that have been inhibited, especially in the areas of mass, dimensions, tyres and vulnerable road user detection systems. BIC acknowledge some of this was outside DITRDCAs control, however, some was within their control. Below are some examples that highlight these issues:

Mass: As outlined earlier in misalignment, ADRs are 18% below current UN requirements. If it wasn't for the additional mass allowances provided by the NHVR initially and now embedded in the HVNL, (for which there is a complex weight chart[4]) bus carrying capacity would have reduced by at least 38%. The onflow to public transport costs would

[4] https://www.nhvr.gov.au/files/media/document/406/202402-0753-nhvr-hv-bus-chart-a3.pdf

mean38% more public buses. With approximately 800 purchased each year at an average of $750K each, a 38% increase amounts to an extra $242M in capital expenditure each year.

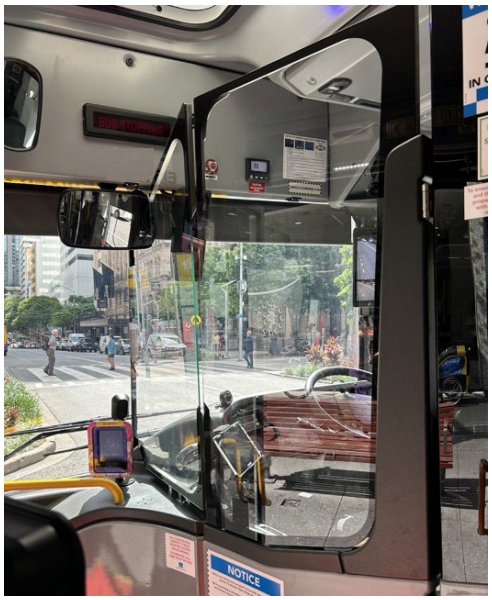
Width: Was outside DITRDCAs control with industry only supporting width changes in May 2023 (Annex A). Since then, there has been action mainly from NHVR. They are currently drafting guidelines to support additional width, but it will be for selected routes only, not all roads. BIC understand changes don't happen overnight, but are not sure why DITRDCA haven't furthered this, though it could be fairly argued this comes down to resource and agility.

Vulnerable road user detection systems: Some bus safety systems such as Blind Spot Detection Systems were not covered in ADRs for some time which meant the systems whilst available could not fitted without an exemption from width, provided by NHVR. Still today there is no ADR requirement on this. Only in October 2023 did a partial solution assist when sensors for these systems were excluded from width. There is still no ADR requirement detailing Blind Spot Detection Systems requirements. This is gap filled by most jurisdictional procurement contracts where it is mandated.

Tyres: Current ADRs limit the maximum tyre pressures 8% lower than what is considered normal internationally. This restricts vehicles in a number of areas, tyre selection, tyre size, and weight carrying capacity, environmental efficiency. The current pressure limits are from nearly 50 years ago for which there is little knowledge ion why these lower limits were imposed.

Even if the mass limits were increased, tyre technical weight limits at the current pressures would restrict vehicles in being able to progress to the higher UN regulations. Current ADR limits would limit any improvement in trye technology being fully recognised in Australia. Higher tyre pressures are also said to have some impact on road wear, so another example where road infrastructure designers need to be consulted.

Bus Safety Screens: BIC and suppliers approached DITRDCA in 2023 regarding ADR challenges in compliance with the inclusion of driver safety screens mandated by Queensland and Victorian Governments. This is on the sheer rise of driver physical assaults and a death in QLD.



- NSW: 45% increase between 2017 and 2023 despite a 17% drop in patronage of buses over the same period[5].
- WA: 92% increase between 2017 and 2023 despite a 15% drop in patronage of buses over the same period[6].
- On average 43% bus drivers experience

[5] TfNSW Quarterly dashboard reports 2019 to 2023 and Bus statistics and trends report, 2020.
[6] PTA WA Incident data 2017 to 2023.

physical assaults [7].

Whilst DITRDCA were supportive in identifying the unique bus specific challenges to ADRs, unless there was an existing international precedent that could be adopted (which there wasn't), they had no resource to assist. Again, a lack of personnel to address specific Australian issues. This leaves drivers safety as a direct risk of lack of resource to sufficiently support industry.

It was left to industry to address them rather than at ADR. The NHVR has stepped in to assist which is a project currently underway.

Key points:

The complex integration web of regulation requires a detailed assessment to assess the impact of international standard harmonisation prior adopting any changes to existing ADRs and be part of the discussion on new ADRs.

Allowances need to support that Australia sometimes will lead the world in regulation development, safety screens being such an example.

Innovate

There is scope within the ADR to be innovative and the recent Seat Belt reminder systems introduced into ADR 68/01 is testimony to that. This process when resourced, worked exceptionally well. This is an example of resource enabling change to suit the Australian bus industry specific needs and its passengers. However, this is driven on the back of two horrible bus strategies in 2023 and BIC lobbying.

Resourcing: These sorts of innovations are so few and far in-between and not common. We shouldn't have to be reactive in order to innovate and we have been told for many years is lack of department resourcing. Resourcing is something that is a constant frustration for the bus industry. Whilst we understand there are only finite resources (and those that are present are very supportive and we are appreciative of that) areas to innovate have been on the back of a tragedy or entirely left upon industry to gap fill. An example of this is bus safety screens as mentioned above.

Manufacturing

Any additions to ADRs should support Australia's diverse supplier base and ensure a level playing field for both local suppliers and importers. A growing concern is the impact of new ADR implementations on local manufacturing. As technology becomes increasingly complex (with an average bus having over 25 on-board computer systems to meet various ADR requirements), the need for advanced testing facilities also rises. This challenge affects not only local manufacturers but also importers from countries lacking similar testing facilities to meet Australian standards. Two very relevant examples to emphasize the issue:

- **Acoustic Vehicle Alert System ADR 113**. Due to a lack of suitable testing facilities highlighted by industry to test for this requirement a local solution which provides abated testing had to be included into the ADR. The cooperation with DITRDCA in

[7] BIC riding on the same bus – policy manifesto 2024.

this case was very supportive and while it wasn't the perfect solution, it highlighted an area where testing requirements is starting to outstrip in-country ability.

- **Electromagnetic compatibility of vehicles (UNECE R10):** If this were to come into force in Australia for heavy vehicles, there is quite simply no testing facility in Australia to test a complete bus. In fact, there is no testing facility to test a large vehicle, with only a few testing facilities able to test medium trucks, and components.

Testing Facilities: The BIC advocates for using Australian Design Rules (ADRs) to enhance the scale and capability of local industries through common user facilities. These facilities, which could be government-owned and leased to manufacturing firms, provide shared infrastructure and technology, fostering a collaborative environment that promotes innovation and export competitiveness.

A proposed common user facility for heavy vehicle safety testing would support the bus, truck, and trailer manufacturing industries all of which have local manufacturing in Australia. It would also support all suppliers who wish to do testing locally, thus not only maintaining jobs, but creating them.

Government support through public procurement and existing federal government special investment vehicles (SIVs), such as the National Reconstruction Fund (NRF) and the Clean Energy Finance Corporation (CEFC), along with the Future Made in Australia initiative, can fund these opportunities, helping industry meet ADR specifications, remain competitive, sovereign ability to manufacture and contribute to Australia's net zero transition.

It also boosts local skills and jobs through apprenticeships, and business innovation.

Key Points

Innovation is only possible with sufficient or allocated resource. Space needs to be left for innovation within Australia to recognise and support our unique requirements.

Unpacking differences and assessing requirements so they can be better aligned, and challenges properly unpacked, and solutions formulated.

If Australia is to maintain its sovereign ability to manufacture in country and innovate.

In country testing needs to be addressed as each new regulation is realised.

Question: The extent to which the current ADR processes support or inhibit choice and price outcomes for consumers

There is a general lack of ability to move outside the requirements listed in international standards to address the specific needs of an ADR and often we here it's a resourcing issue. The result of this is choice and is limited by vehicle configurations but again that is gap filled by NHVR, the HVNL and NTC.

Choice

Whilst not specifically raised in this consultation, safety is a key consideration along with choice. Safety has been inhibited as a choice for consumers. One example is as systems for blind spot detection on buses (As detailed earlier in this document) were not permitted even to the point of one customer having to remove them from their fleet. A clear backward step.

The different way Australia quote dimensions in ADRs (as detailed earlier) especially rear overhang calculations has severely restricted choice for consumers as models freely available internationally simply don't comply with local requirements. Again, the NHVR have stepped up and assisted by gap filling with solutions that help but don't solve the matter.

In some cases, manufacturers have invested over $500K dollars in adjusting a single model design to accommodate the unique Australian requirements in this area. This is a considerable amount of money when total volumes of this model are less than twenty a year. This is a contributing factor in why some major global OEMs have simply pulled out of the Australian bus market, ie; Mercedes-Benz and Hino. This ultimately restricts choice also for consumers.

Support

Whilst ADRs haven't specifically supported price or choice, they have been supported through the NHVR and HNVL. Specifically, these projects align to initiatives to improve productivity such as long buses between 12.5mt and 14.5mts in length. These are commonly referred to as Controlled Access Buses (CABs). Whilst not a perfect solution they have supported where otherwise there would have been no ADR option.

Question: Opportunities for improving ADR processes to support the transition to net zero.

Whilst stakeholders may illustrate their views with examples of current or proposed ADRs, it is not the function of this review to reconsider the content of individual ADRs.

This is a very similar answer to the first question on processes for which processes in general were covered. BIC wish to highlight setting better framework in general will support any regulation. The keynote on zero emission is that it's not just specifically about the technology of zero emission vehicles as the technology is not new to our industry. The biggest opportunity to improve zero emission transition is to also address the supportive intertwined regulations around for example but not limited to weights, dimensions and safety technology that enable zero emissions full benefits to be realised.

Key Point:

Addressing the larger ADR process will assist in transition.

Recommendations

To support and in addition to the questions raised in this consultation, BIC has collated a series of recommendations to support harmonisation but also recognise that industry requirements. They are:

1. **Safety:** Safety remains paramount and not compromised at all.
2. **Parallel development:** Evaluation and then adoption of UN Regulation into ADRs in development of an UN regulation initial development or series update. Saves time.
3. **Parallel Challenges:** Acknowledge the need to recognise, allow for, and address parallel challenges due to fundamental different requirements between countries. Additionally, it is important to recognize the specific needs of Australian operating requirements and conditions at a country level, especially if they are not adopted in the UN regulations.
4. **Assess Individually:** Each regulation should be assessed individually in collaborative consultation with industry stakeholders. This is critical where there are so many state or regulatory body requirements woven around or supplementary to ADRs.
5. **Resource:** DITRDCA is suitably and better resourced to address the above points. Industry should not have to take up the slack.
6. **Stringency:** Recognizing that certain existing ADRs are more stringent or tailored to Australian needs, it is recommended to either adopt these requirements into EU regulations to enhance their effectiveness or retain the ADRs in their entirety.
7. **Testing:** Ensure appropriate testing facilities are available in Australia to comply with the requirements of the regulation, or where this is not possible, simplified tests are agreed upon in consultation with Industry stakeholders.
8. **Equal Playing Field:** Harmonisation creates an equal playing field that is supportive for both local and imported vehicles without restricting local manufacturing.
9. **Planning:** DITRDCA provide industry with better long term regulatory strategy direction, thus allowing manufacturers better visibility on where to allocate resources for future product development.
10. **Timing:** Practical timeframes are consulted with industry prior to regulation implementation. As a general rule this is two years for new model vehicles, and three years for all (new) vehicles. This allows time for industry to develop solutions, especially where models are specific for the Australian market or locally produced.
11. **Collaboration & Expertise:** That DITRDCA continues to improve on collaboration with Industry on any regulatory changes, recognising that industry subject matter

experts possess valuable knowledge in areas such as technical, contractual, commercial or otherwise.

Collaboration at every step and forward planning are the key.

Finally: Buses and coaches like other heavy vehicles should not be evaluated within the same general framework as passenger cars due to distinct factors such as the local manufacturing landscape, which is tailored to meet the specific demands of bus and coach production, and the unique operating conditions in Australia.

Our vast and varied terrain requires buses and coaches handle extreme conditions, unlike the more urbanised environments in Europe. Additionally, regulatory and safety requirements in Australia are designed to address these local challenges, ensuring that buses and coaches meet stringent standards suitable for the Australian market.

Passenger requirements, such as comfort and safety, are also paramount, with specific in-country nuances like road conditions and expected vehicle lifespan influencing design and operational standards.

Further Consultation

Should DITRDCA wish, the BIC would be open to discuss this document and commentary in further detail.

Annexes and Supportive Information

A. Width and Mass Policy 2023.
   Copy attached.
B. Bus Safety Initiatives Paper 2023.
   https://bic.asn.au/wp-content/uploads/doc/BIC0164.pdf
C. Transition to Net Zero Policy 2024.
   https://bic.asn.au/wp-content/uploads/BIC-Industry-Policy-Position-Paper_Driving-Towards-Zero-Emissions_June-2024.pdf

End

BIC PAPER ON Dimensions and Mass for Low and Zero Emissions Buses and Coaches

February 2023

Contents

1. Introduction

This paper reviews the status of heavy vehicle body mass and dimensions as it relates to buses and coaches. Consequently, the paper also provides an update on the BIC position for wider vehicles (specifically 2.5 to 2.55 m body width) as it relates to the Australian bus industry.

2. Zero and Ultra Low Emission Bus and Coach Mass Effects

With the introduction of both zero emissions buses, as well as ultra-low emission Hybrid, Euro VI and beyond diesels, buses are getting heavier. This effect is well known, and the EU have long recognised this such that they have provided increases in operating mass allowances for zero emission buses and coaches of up to 2.5 tonne per bus type and that such allowances have been in place since 2015 (these allowances are significantly above the current Australian limits).

The EU allowances were provided so that the new technology buses could achieve equivalent passenger carrying capacity when compared to diesel powered buses. And although buses are typically only fully loaded a small percentage of the time (such as towards the end of a trip), reductions in passenger capacity (per bus) typically requires an additional bus, or coach, to address such shortfalls

(Note: the positive emissions effect of a new ZEB, which has reduced passenger capacity, are reduced as additional buses are needed for peak service times).

In Australia, two axle buses are limited to 18 tonne, three axle buses are limited to 23 tonne and articulated buses are limited to 26 tonne. Although these Australian mass limits worked with traditional diesel type buses, such limits do not work with the heavier zero, and ultra-low, emission bus technologies.

3. Status of the BIC Position on Body Width

The BIC position on body dimensions has been to support the 2.5 m body width as determined by ADR 43/04 and where suppliers wanted to provide 2.55 m product to market (or in turn operators wanted to utilise such buses or coaches), then the established PBS processes could be utilised. Also, recent updates in the controlled access routes have given certain 2.55 m heavy vehicles and 2.55 m rigid buses general access status.

However, with the expanding local ZEB and ultra-low bus emissions market, the BIC continues to support the PBS processes, but the recent decision from the BIC council is that in addition, the BIC is to seek ADR changes to allow for wider 2.55 m buses.

The main reason for this change in policy being the combinations of increased axle mass limits and low floor accessible passenger access needed is leading to a general use of wider independent front suspension systems as discussed in Section 6 of this paper.

4. Background to SVSEG and Safer Heavy Vehicles

The National Road Safety Action Plan 2018-2020 included a commitment to investigate the introduction of safer, cleaner heavy freight vehicles by minimising regulatory barriers, and commencing in 2018, discussions were held with the Department of Infrastructure, Transport, Regional Development and Communications, Vehicle Standards Section (the Dept.), and industry stakeholders in regard to how this commitment could be achieved. These discussions were propagated through the Strategic Vehicle Safety and Environment Group (SVSEG) and were aimed at both the truck and bus industries.

The trucking industry responded to this with the overall position that they needed an increase in body width to allow for the broader uptake of safer and cleaner heavy freight vehicles and a series of papers were provided to this effect.

The BIC presented its position on this issue at SVSEG in December 2018, which reflected the BIC policy that buses and coaches were already achieving the required, and highest, safety and emission reduction requirements within the ADR bus body dimension requirements. The only over width or dimensional items were things such as external CCTV cameras, and sensors for assisted driver vision systems.

Further negotiations took place over the intervening two-year period, and these led to the Dept. proposing a set of ADR changes to accommodate the positions posed by both the truck and bus industries. The ADR changes are being implemented as discussed below.

4.1 RIS on Safer Freight Vehicles

In 2021, the Dept. released a RIS that considered a possible range of changes to the ADRs to facilitate an increased take up of safer and/or more efficient heavy freight vehicles in Australia. This included options for:

- Vehicles with enhanced devices for indirect vision and/or monitoring devices to detect other road users;
- More productive and safer wider freight vehicles – including four options (with 2.55 and/or 2.6 m), each with proposed new safety requirements; and
- Freight vehicles with more efficient and/or productive axle configurations.
- Buses were excluded from the wider body allowances as the BIC position at this time was that buses and coaches with a body width of 2.5 m can, and already did, employ the advanced safety features.
- The only dimensions issues for buses were the ADR changes needed to formally address the extra width and length required to accommodate items such as sensors and cameras used with these new safety systems.
- The BIC also advised that that an increase in the actual body width did not then result in increased bus/coach carrying capacity as passenger capacity increases are governed by body length and the current Controlled Access Bus regulations allow for high capacity rigid buses and coaches.

- The RIS contained four options these being:
  - *Option 1a – Increase the width limit to 2.55 m for goods vehicles and trailers over 4.5 tonnes.*
  - *Option 1b – Increase the width limit to 2.55 m for goods vehicles over 4.5 tonnes only.*
  - *Option 2a – Increase the width limit to 2.6 m for goods vehicles and trailers over 4.5 tonnes.*
  - *Option 2b – Increase the width limit to 2.6 m for goods vehicles over 4.5 tonnes only.*
- Submissions for the RIS closed on Wednesday 30 June 2021.
- During the negotiations period, meetings were held with the Dept, and noted issues were:
  - The Dept. accepted the trucking industry position that safety needs extra body width.
  - Overall, the main caveat for the added width was that any wider vehicles must have all the required safety features to offset the increased risk of the wider body.
  - There was some discussion regarding electric buses needing to be 2.55 m wide, but no approaches were made to BIC from any members on this issue at that stage.
- The outcome from the RIS process was the adoption of Option 1a – Increase the width limit to 2.55 m for goods vehicles and trailers over 4.5 tonnes only.
- These ADR changes also allow for buses and coaches to fit range of equipment to the exterior of the body that can be outside the 2.5 m limit, such as CCTV cameras and radar sensors for safer vision systems such as vulnerable road user sensing systems.

  (Note: The details on these amendments are provided in Appendix A of this paper and it needs to be noted that whether the body width is 2.5 or 2.55 m, these safety system exterior components need extra width, therefore a 2.5 m body has in effect an overall width of 2.55 m, and a 2.55 m body would then have an overall width of 2.6 m with these systems fitted).

5. Current Compliance Process for New Local Manufactured and Imported Buses/Coaches

Currently the options for compliance and access rights for a new bus or coach into the Australian market in terms of dimensions, these being:

a) **Standard Rigid Bus/Coach:** To supply a rigid bus/coach that is within the ADR limits of 2.5 m and 12.5 m. Such a vehicle has full network access rights.

b) **Standard Articulated Bus/Coach:** To supply an articulated bus/coach that is within the ADR limits of 2.5 m and 18.0 m. Such a vehicle has full network access rights.

c) **Rigid Bus/Coach over 12.5 m (ADR limit for rear overhang):** To supply a bus/coach that is within the ADR limits of 2.5 m but is over the 12.5 m length and less than 14.5 m in length plus with a rear overhang compliant to the ADR limits. This type of vehicle receives an over dimension (OD) ADR compliance and is then required to apply via the NHVR for a Class 2 Controlled Access Bus (CAB) approval. Given this approval, the bus can then operate on the CAB Network.

d) **Rigid Bus/Coach over 12.5 m (in excess of ADR limit for rear overhang):** To supply a bus/coach that is within the ADR limits of 2.5 m but is over the 12.5 m length and less than 14.5 m in length plus with a rear overhang outside the ADR limits. This type of vehicle receives an over dimension (O.D.) ADR compliance and is then required to apply via the NHVR for a Class 3 Controlled Access Bus (CAB) approval. Given this approval, the bus can then operate on the CAB Network.

   It should be noted that the ADR O.D. approval and then the CAB process provides the industry with a simpler and consistent process to compliance a bus/coach and then to register and operate that vehicle. (The PBS process, which is only required when a bus is outside these ADR limits, has not been a popular option for the bus industry and there are only limited numbers of coaches that are operating under the PBS process).

e) **Bus/Coach over ADR dimension in Width, Height or Length (for example were the body or axle(s) are over width):** The final option is to supply a bus/coach that is outside of the ADR dimensions in some way. That is it is outside the ADR width, length, or height limits, then such a bus/coach is typically given a non-standard ADR approval and is then required to apply to the NHVR for a nonstandard access permit or undergo the PBS process with the view of achieving PBS approved access rights.

(Note: these standards allow for the use of established higher productivity buses and coaches and for vehicles outside these established norms, the PBS processes are available).

6. Current Issues for Chassis Suppliers

In recent times, chassis suppliers have raised issues where they are having difficulties with the supply of new technology chassis that meet the current Australian 2.5 m width requirement. As reported, there are a number of factors making the supply of such chassis possible but more complex, with the main issues being higher axle mass requirements in combination with accessible bus requirements.

These issues are given in the following and although these issues are EU centric, all major international chassis and complete bus suppliers comply with the EU market requirements (or their respective home country equivalents):

Higher Axle Mass Requirements:

- With the wider introduction of both zero emissions buses, hybrids, as well as new generation Euro VI and beyond diesel buses, buses are getting heavier.
- In the EU, via Regulations 2015/718, 2015/719 and 2019/1242, the axle mass limits have been increased for zero emission and alternative fuelled buses. These increased limits are:
    - Two Axle buses low emission buses have increased from 18 to 19.5 tonne GVM.
    - Three Axle rigid buses have increased from 26 tonne to 27 tonne for alternative fuelled and 28 tonne GVM for zero-emission technology.
    - Articulated buses have increased from 27 tonne to 28 tonne for alternative fuelled and 30 tonne GVM for zero-emission technology.

- Axle limits do apply based on various combinations and the front axle width has increased to allow for independent front suspension that can accept these higher axle limits.

(Note: Australian limits are; two axle 18 tonne, three axle 22 tonne and articulated 26 tonne regardless of engine or drive line type).

EU Changes to Accessible Bus Requirements:

- The EU has implemented various Disability Accessibility Strategies (2010 to 2020 and now 2020 to 2030) that have increased the stringency of requirements for bus accessibility such that chassis suppliers have had to increase the clear width between the front axle wheelarches to 900 mm (this is a result of changes to R107 Annex 8 Accommodation and accessibility for passengers with reduced mobility).

To address the above issues, chassis suppliers have progressed to higher capacity independent front suspension that also need to be sufficiently wide to accommodate the above front wheelarch widths. Additionally, the higher axle limits are also requiring the use of wider section tyres, which is also effecting axle width.

6.1 How to Address These Issues?

To address the above issues, the BIC considered several options, the first to seek extra ADR width allowances for specific bus axle combinations and the second to seek extra ADR width allowances for the complete bus or coach (that is for the BIC to align with the Safer Heavy Vehicles width allowances).

Following an extended review, the BIC council decided on the second option, being that the is to BIC seek an ADR change that allows buses or coaches to be built to 2.55 m body and axle width (in conjunction with an ADR change to allow for the external addons such as cameras and sensors to go to 2.6 m).

Noting that other general outcomes from such a change could be:

- An ADR change to allow 2.55 m buses and coaches, would allow a clearer path for suppliers to import wider fully built-up product.
- An ADR change in width would also allow for wider front axle configurations, with wider section higher mass rated tyres, even on 2.5 m bodies.
- It should also be noted that current state government bus supply contracts limit body width to 2.5 m, but this could change over time.

Considering the above, the BIC council has also agreed that the BIC Executive need to seek ongoing support for local manufacturing of buses and coaches regardless of the configuration.

7. Effects on Local Manufacturing

While there is recognition that the change in the body width allowance may have an effect on the local bus builders, State Government Procurement Policies for the purchasing of Buses for Public

Transport Contracts are heavily weighted towards local content. This also extends to sub-component suppliers for example; seats, electronic bus equipment and bus door manufacturing.

In addition, the BIC council have requested that the BIC Executive pursue a program to develop an industry approved process for the calculation of local content for the various components used within the bus manufacturing industry. This would be intended to assist the State Government Procurement Bodies with the voracity of the local content claims put forward by suppliers during tendering and assessment processes.

8. Proposed ADR Width Increase Package

The BIC considers that any request for an ADR change to allow for an increase in overall bus and coach width to 2.55 m, needs to be part of a package that would not only ensure the ongoing high level of bus and coach safety, but also to address known operating mass issues for both increased bus mass but also the increasing per passenger mass (population getting heavier).

Therefore, the BIC suggests the following package be considered as part of an ADR change to 2.55 m:

- **Masses:** Implement a modular axle mass approach, that being:
    - **Two axle rigid:** 7 tonne front axle, 12.5 tonne rear axle, gross 19.5 tonne for ZEB's, or Ultra Low Emission buses being Euro VI and above.
    - **Three axle rigid:** 7 tonne front axle, 6.5 tonne tag axle and 12.5 tonne drive axle for tonne for alternative fuelled and 25 tonne GVM for ZEB's, or Ultra Low Emission buses being Euro VI and above.
    - **Articulated:** 7 tonne front axle, 12.5 tonne centre and 12.5 tonne rear axle, but 30 tonne gross (floating 2 tonne), for ZEB's, or Ultra Low Emission buses being Euro VI and above.
- **Axle widths:** Chassis with 2.55 m axles can be used with either a 2.5 or 2.55 m bus body.
- **Use of Wide Tyre Sections:** Wide 315 section type tyres, for example 315/80R22.5 on all steer and tag axles (min 295/80R22.5 on duals).
- **Recalculation of Passenger Masses:** The BIC current 65 and 80 kg per person issue to be addressed and that the use of 80 kg for passenger capacity is formally adopted for all passenger mass calculations for buses and coach using the higher mass limits (currently the 80 kg is a guide only).
- **Vehicle Safety Systems:** As these systems evolve over time, and that the bus and coach industry have a proven history for being early implementers of all such systems, that a general commitment would be given that buses and coaches utilising the increased mass allowances would also need to have set safety packages (given that these packages will evolve over time for new vehicles).

The types of systems that are currently in general use on newer buses and coaches are given below and to allow for innovation, the BIC would suggest that an agreed minimum set of features be reached with regulators, and then some form of continuous implement plan be put in place for new vehicles that utilise the higher masses.

Currently adopted safety systems include those listed below and such systems could form part of agreed safety packages:

- **Advanced Suspension and Braking Systems:** Such as Anti-collision system - AEBS 'Advanced Emergency Braking System' provided on the chassis, EBS 'Electronic Braking System', ESP 'Electronic Stability Program', ABS 'Antilock Braking System', ASR 'Acceleration Skid Control'.
- **Advanced Vision Systems:** On board CCTV with remote access, venerable road user systems, reversing and low speed driver vision assistance.
- **Active Driver Assistance:** Lane Keeping System (departure warning), Active Cruise Control (keeping a set time gap to the vehicle in front), Collision warning System with Automatic Emergency Braking (AEBS).
- **Fire Safety Systems:** Use of active fire monitoring and protection system in engine bays, smoke detectors and tyre pressure monitoring as per BIC Fire Mitigation Advisory.

Appendix A: Safer Freight Vehicles Outcome

Option 1a – Increase the width limit to 2.55 m for goods vehicles and trailers over 4.5 tonnes

Under this option (wording provided from draft ADR papers released by the Dept.):

- The vehicle width limit for goods vehicles (i.e. trucks) over 4.5 tonnes GVM and trailers over 4.5 tonnes ATM (ADR category NB2, NC, TC (over 4.5 tonnes) and TD vehicles), would be increased from 2.5 m to 2.55 m.
- Permanently fixed webbing-assembly-type devices (such as curtain-side devices) would be excluded from the measurement of the vehicle width, provided the maximum distance across the body of the vehicle, including any part of the devices, is not more than 2.6 m.
- The wider goods vehicles (those exceeding the current 2.5 m limit) would be required to:
  - meet a new ADR 14/03 – Devices for indirect vision (refer Appendix 3), incorporating the technical requirements of the latest version of the relevant international standard (UN R46/04), with additional provisions to allow for US style crossover mirrors (refer Glossary in Appendix 1) to be used on bonneted trucks in place of UN style front-view mirrors, provided these allow the driver to see at least 900 mm past the extreme outer edge of the left-hand (near) side of the vehicle;
  - meet a new ADR 35/07 – Commercial Vehicle Brake Systems, which is currently being developed to extend the scope of the mandatory ESC requirements (referred to in the ADR as a Vehicle Stability Function) to apply to a broader range of heavy vehicles (refer Appendix 4) – note: this would include exemptions from fitting ESC to trucks with four or more axles and trucks designed for off-road use, as per UN R13 and ADR 35/06;
  - meet a new ADR 97/00 – Advanced Emergency Braking (refer Appendix 5) for Omnibuses, and Medium and Heavy Goods Vehicles, incorporating the technical requirements of the latest version of the relevant international standard (UN R131/01) – note: this would include exemptions for trucks with four or more axles and trucks designed for off-road use, as per the EU requirements and as recommended in UN R131;
  - meet a new ADR 99/00 – Lane Departure Warning Systems (refer Appendix 6), incorporating the technical requirements of the relevant international standard (UN R130) – note: this would include exemptions for trucks with four or more axles and trucks designed for off-road use, as per the EU requirements and as recommended in UN R130;

  - meet a new ADR 105/00 – Blind Spot Information Systems (refer Appendix 7), incorporating the technical requirements of the relevant international standard (UN R151) – note: this ADR would only apply to goods vehicles over 8 tonnes GVM, as per UN R151 (and from a later date than the other proposed new ADRs – see below);
  - meet a new ADR 106/00 – Side Underrun Protection (refer Appendix 8), incorporating the technical requirements of the latest version of the relevant international standard (UN R73/01) – note: this ADR would not apply to prime movers, as per UN R73; and
  - if over 7.5 tonnes GVM (and excluding prime movers), be fitted with conspicuity markings (refer Appendix 9) in accordance with ADR 13/00 (or any later version of this ADR).

- The wider trailers (those exceeding the current 2.5 m limit) would be required to:
  - meet a new ADR 106/00 – Side Underrun Protection (refer Appendix 8), incorporating the technical requirements of the latest version of the relevant international standard (UN R73/01); and
  - be fitted with conspicuity markings (refer Appendix 9) and reversing lamps in accordance with ADR 13/00 (or any later version of this ADR).

The new ADRs/ADR requirements for devices for indirect vision, AEB, ESC, LDWS, and side underrun protection, would be mandatory for goods vehicles exceeding the current 2.5 m width limit (with some limited exemptions – as noted above), from the same date the ADR amendment to allow wider vehicles (under standard approval processes) commences. These ADRs/ADR requirements would all be optional for vehicles not exceeding the current 2.5 m width limit, unless mandated through a separate ADR development process (e.g. as is currently being considered for AEB for heavy vehicles) to this proposal or where already a mandatory requirement (e.g. ESC for prime movers and shorter wheelbase rigid trucks). The same principles would be applied in regard to the applicability of the new ADRs for wider trailers – these would be mandatory for trailers exceeding the current 2.5 m width limit, and optional for trailers within the current limit (unless mandated through a separate ADR development process to this proposal).

It is proposed the new ADR for blind spot information systems (for detection of bicycles) would be mandatory for new heavy goods vehicles over 8 tonnes GVM and exceeding the current 2.5 m width limit, from 1 July 2024 for new models and 1 January 2025 for those models existing in the market prior to the new models date (1 July 2024). This is because this is a relatively new UN regulation, which will not be mandatory for all new heavy goods vehicles (over 8 tonnes maximum permissible mass) in the EU until July 2024.

If this option is implemented, a special allowance for refrigerated bodywork up to 2.6 m wide and/or a more general move to a 2.6 m width limit could still be considered at a later stage.